

## II. REMARKS

The final Office Action dated July 13, 2006, has been received and carefully noted. The above amendments and the following remarks are being submitted as a full and complete response thereto.

Claims 1-10 are pending. By this Amendment, claims 1 and 9 are amended. The amendments are supported by the originally filed specification and claims. For example, the amendments to claims 1 and 9 are supported by Table 14 on page 33 of the specification, as the Examples of the present invention do not contain CFC 11 in contrast to the Comparative Example  $\alpha$ . No new matter is added.

Entry of this Amendment is proper under 37 C.F.R. §1.116 since this Amendment: (a) places the application in condition for allowance for reasons discussed herein; (b) does not raise any new issue regarding further search and/or consideration since the Amendment amplifies issues previously discussed throughout prosecution; (c) does not present any additional claims without canceling a corresponding number of finally-rejected claims; and (d) places the application in better form for appeal, should an appeal be necessary. Entry of the Amendment is thus respectfully requested.

Claims 1-10 are rejected under 35 U.S.C. § 112, second paragraph, for the asserted indefiniteness. This rejection is traversed.

Applicants respectfully submit that this rejection is overcome by the above amendments to claims 1 and 9. In particular, present claim 1 discloses "substituting CFC 11 in its entirety with azeotropic or near azeotropic foaming agents compositions" (emphasis added) and claim 9 discloses "the substitution of CFC-11 in its entirety with

foaming agent azeotropic or near azeotropic compositions” (emphasis added). As noted above, these amendments are supported, for example, by Table 14 on page 33 of the specification, as the Examples of the present invention do not contain CFC 11 in contrast to the Comparative Example  $\alpha$ . Further, the specification discloses that “[t]he present invention relates to azeotropic or near azeotropic compositions to be used as trichlorofluoromethane (CFC 11) substitutes in the foaming field” (Specification, page 2, lines 1-3) and that “the hydrofluoropolyether-based mixtures (HFPE), object of the present invention, are characterized by chemical-physical properties such to be suitable as substitutes of CFC 11.” Dependent claims 2-8 and 10 are patentable for at least the same reasons.

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-10 under 35 U.S.C. § 112, second paragraph, for the asserted indefiniteness.

Claims 1-10 are rejected under 35 U.S.C. § 112, first paragraph, for insufficient written description. This rejection is traversed.

Applicants respectfully submit that specification includes sufficient written description to support the process of the presently claimed invention. For example, Applicants submit that, as discussed below, the Examples in the specification sufficiently demonstrate that the claimed azeotropic or near azeotropic compositions of the presently claimed invention can be used as substitutes of CFC 11. In particular, Applicants note that Table 14 on page 33 of the specification discloses the quantity of each component in the compositions of the following examples:

- Example  $\alpha$  comparative, which contains CF 11;
- Example  $\gamma$  which contains composition IV of claim 1; and
- Example  $\delta$  which contains composition V of claim 1.

Accordingly, based upon the quantities listed in Table 14, Applicants have calculated the % by weight of each of the components of these compositions, as reported in Table A below.

Table A

	Example $\alpha$ Comp. (%w.)	Example $\gamma$ (%w.)	Example $\delta$ (%w.)
Polyolpolyether	33.9	33	32.4
Water	0.7	0.8	0.9
Aminic catalyst	0.8	0.8	0.9
CFC 11	10.2	-	-
HFPE1/HFC 365mfc (60/40)	-	9.8	-
HFPE1/HFC 356ffa (20/80)	-	-	9.2
Isocyanate	54.4	55.7	56.7

From the calculated percentages by weight shown in enclosed Table A, Applicants note that percentages of each component in the three formulations are very similar. For example, the foaming agent is present in 10.2% by weight in Example  $\alpha$  comparative (CFC 11), 9.8% by weight in Example  $\gamma$  (composition IV), and 9.2% by weight in Example  $\delta$  (composition V). As such, the amount of foaming agent in Example  $\gamma$  and Example  $\delta$  is quite near to that of CFC 11 in Example  $\alpha$  comparative. In fact, there is less than a 1% difference (i.e., 10.2%-9.2%) in the amount of foaming agent in Example  $\delta$  and Example  $\alpha$  comparative.

Meanwhile, Example  $\alpha$  comparative contains only 1.5% by weight more (33.9%-32.4%) of polyolpolyether than the formulation of Example  $\delta$ , Example  $\delta$  contains only 2.3% by weight more (56.7%-54.4%) of isocyanate than the formulation of Example  $\alpha$  comparative, Example  $\delta$  contains only 0.2% by weight more of water (0.9%-0.7%) than the formulation of Example  $\alpha$  comparative, and the percentage by weight of the aminic catalyst is the same in the three formulations.

Accordingly, Applicants respectfully submit that these three formulations are very similar to each other and thus have comparable compositions. In fact the % by weight variations are lower than 2.5% and are reduced between the individual compositions. The differences in compositions may be due to the fact that it is difficult, from an experimental point of view, to prepare foaming formulations having the same compositions when different blowing agents are used, as blowing agents are generally volatile liquids. Further, Applicants submit that it is well known that isocyanate is generally present in excess, such that the quantity added is usually not carefully weighed.

Further, Applicants note that the foams obtained from the formulations of Table 14 were prepared under the same conditions, i.e., by the procedure described at page 32 of the specification.

Also, Table 14 on page 33 of the specification discloses that the foam density of the foamed formulation of Example  $\gamma$  is the same as the foam density of the foamed formulation of Example  $\alpha$  comparative (i.e., 30 kg/m<sup>3</sup>). Meanwhile, the foam density of the foamed formulation of Example  $\delta$  differs from the foamed formulation of Example  $\alpha$  comparative by only 0.2% (30 kg/m<sup>3</sup> – 29.8 kg/m<sup>3</sup>). Those of skill in the art would

recognize that by an industrial point of view, this small difference in has no practical relevance and may be within the experimental error of the foam density determination.

Therefore, Applicants submit that the formulations of Examples  $\gamma$  and  $\delta$  are sufficiently similar to Example  $\alpha$  comparative to demonstrate sufficient support for the claimed substituted of CFC 11 by the azeotropic or near azeotropic compositions of the presently claimed invention.

In contrast to the assertion on page 3, lines 5-7 of the Office Action, Applicants respectfully submit that the specification sufficiently discloses "CFC-11 blown foams having the claimed range of density for all polyurethane foam formulations encompassed by the claims." For example, Examples  $\gamma$  and  $\delta$  ( $30 \text{ kg/m}^3$  and  $29.8 \text{ kg/m}^3$ , respectively) demonstrate that the azeotropic or near azeotropic compositions IV and V of claim 1 are effective substitutes of CFC 11 in foam formulations "to give a homogeneous foam having density of about  $30 \text{ Kg/cm}^3$ " (claims 1 and 9) (emphasis added).

For at least the above reasons, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-10 under 35 U.S.C. § 112, first paragraph, for insufficient written description.

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by Klug et al. (U.S. Patent Nos. 5,605,882, 5,648,016, and 5,779,931). This rejection is traversed.

Applicants respectfully maintain that the cited patents to Klug et al. do not disclose compositions comprising "(IV) difluoromethoxy bis(difluoromethyl ether)  $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$  and 1,1,1,3,3-pentafluorobutane" or "(V) difluoromethoxy

bis(difluoromethyl ether)  $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$  and 1,1,1,4,4,4-hexafluorobutane” (claims 1 and 9) (emphasis added).

Further, Applicants respectfully submit that compositions (IV) and (V) are not inherently disclosed by Klug et al., as asserted by the Examiner. The broad disclosure of “compositions that include at least one fluoroether and at least one hydrofluorocarbon” in the Abstracts of the cited patents to Klug et al. does not teach or suggest the particular compositions of the presently claimed invention, much less the unexpected results thereof. As noted by MPEP § 2131.02, “[a] genus does not always anticipate a claim to a species within the genus.” As noted in Applicants’ previously filed remarks, the presently claimed compositions are not clearly disclosed by Klug et al., as the cited patents to Klug et al. do not disclose “1,1,1,3,3-pentafluorobutane ( $\text{CF}_3\text{CH}_2\text{CF}_2\text{CH}_3$ , HFC 365mfc)” of composition IV) or “1,1,1,4,4,4-hexafluorobutane ( $\text{CF}_3\text{CH}_2\text{CH}_2\text{CF}_3$ , HFC 365ffa)” of composition V), much less in combination with the hydrofluoroethers of Klug et al. or the “difluoromethoxy bis(difluoromethyl ether) ( $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$ ) ” of composition IV) and the “difluoromethoxy bis(difluoromethyl ether) ( $\text{HCF}_2\text{OCF}_2\text{OCF}_2\text{H}$ ) ” of composition V) in particular, respectively.

As Klug et al. does not disclose each and every element of independent claims 1 and 9, Applicants submit that Klug et al. does not anticipate these claims. Dependent claims 2-4 and 10 are patentable for at least the same reasons. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9, and 10 under 35 U.S.C. § 102(b) over Klug et al.

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Klug et al. This rejection is traversed.

Applicants respectfully submit that the particular combinations of compositions (IV) and (V) of claims 1 and 9 would not have been obvious over the broad disclosure of Klug et al., much less the unexpected advantages thereof.

Applicants respectfully submit that the technical problem of the presently claimed invention must be considered, as well as the lack of motivation in the disclosure of Klug et al. for one of skill in the art to solve this technical problem, much less in the manner of the presently claimed invention. Klug et al. does not even disclose CFC-11, much less the substitution of CFC-11 with the compositions of the presently claimed invention or the unexpected advantages thereof.

In particular, Applicants respectfully submit that the Declaration of Dr. Basile is commensurate in scope with the claims, as the Declaration compared seven azeotropic or near azeotropic compositions of Klug et al. (see the '842 patent to Klug et al., Table 1, column 10-11). The Declaration demonstrates that the particular solution found by the Applicant was not obvious, as all of the tested compositions in the Declaration did not work as substitutes of CFC 11 in foaming formulations.

Further to the previously filed remarks in the Amendment filed April, 28, 2006, Applicants respectfully maintain that the Declaration of Dr. Basile demonstrates that only specific compositions of a hydrofluoroether and a hydrofluorocarbon can be used according to the presently claimed invention, i.e. as substitutes of CFC 11 to obtain a foam having about the same physical properties and foam density of that given by CFC

11 ("about 30 kg/cm<sup>3</sup>" in claims 1 and 9) , under the conditions employed to obtain a foam with said CFC. In fact, the Declaration shows that foams prepared from the same polyurethane polymer with blowing azeotropic compositions disclosed by Klug et al., expanded in the same conditions used for CFC 11, gave foams that were different from those obtained with CFC 11.

Applicants submit that relying both on the general formulas of the hydrofluoroether and hydrofluorocarbon given in the abstracts and disclosure of the cited patents to Klug et al., those of skill in the art would not have been able to select between the therein reported azeotropic compositions, much less a selection to achieve the compositions of the presently claimed invention.

If such a selection would have been obvious over the cited patents to Klug et al., as asserted in the Office Action, Dr. Basile in his declaration would have found that all the compositions of Klug et al. were equally suitable to form polymeric foams having about the same density of CFC 11, when let to foam in polymeric materials under the same conditions of CFC 11. However, as noted above, the Declaration shows that this was not the case.

Further, Applicants again note that Example 2 on page 32 of the present specification discloses an embodiment of the present invention that was blown in polymeric materials under the same conditions employed to obtain a foam with CFC 11. In brief, according to Example 2, the blowing agent was admixed with water and polyol and then, under stirring, isocyanate was added and the foams were "allowed to freely expand until the completion of the reaction." As discussed above, Table 14 on page 33



of the specification discloses that when a polymeric foam is expanded with the blowing agent compositions IV) and V) of the present invention, in the same conditions used for the blowing agent CFC 11, the foam density and foam appearance are about the same (See Example  $\gamma$  and Example  $\delta$ ).

As to the lack of motivation in Klug et al., Applicants emphasize that the present invention is not concerned with controlling and optimizing result effective variables. Instead, binary azeotropic compositions must be found having the following combination of properties:

- They should produce foams having comparable density with those obtained with CFC 11; and
- The conditions used to obtain said foams should be the same used for CFC 11.

Therefore, as Klug et al. does not even disclose CFC 11, those of skill in the art faced with the technical problem of the presently claimed invention would not have found motivation in Klug et al. to the solution of the presently claimed invention. Accordingly, Applicants respectfully submit that an improper hindsight analysis has been asserted, based upon the disclosure of the presently claimed invention.

As Klug et al. do not teach or suggest all of the elements of the claims 1-4, 9 and 10, Applicants submit that these claims would not have been obvious to those of skill in the art over the disclosures of the cited patents to Klug et al., alone or in combination. As such, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-4, 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over Klug et al.

Claims 5-7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Klug et al. in view of Barthelemey et al. (U.S. Patent No. 5,304,320). This rejection is traversed.

Please see the above discussion distinguishing claim 1 from the cited patents to Klug et al. As claims 5-7 are dependent upon claim 1, Applicants submit that claims 5-7 are patentable for at least the same reasons as claim 1. Further, Applicants submit that Barthelemy et al. does not satisfy the deficiencies of the cited patents to Klug et al. Please see Applicants remarks in the Amendment filed January 4, 2005.

Applicants respectfully submit that it would not have been obvious to those of skill in the art to make "certain experiments and adaptations" to determine the blowing agents of the present claims to yield suitable foams, in contrast to the assertions on page 6 of the Office Action. In particular, Applicants submit that neither Klug et al. nor Barthelemey et al. provide any motivation for those of skill in the art to conduct such experiments, much less to find the solution to the technical problem of the presently claimed invention, as discussed above. Further, the showing in the Declaration that the blowing compositions of the Klug et al. did not yield suitable foams demonstrates that the presently claimed invention, and the unexpected results thereof would not have been obvious to those of skill in the art in view of the disclosures of the cited references.

As the cited references do not teach or suggest all of the elements of claims 5-7, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 5-7 under 35 U.S.C. § 103(a) over the cited patents to Klug et al. in view of Barthelemy et al.

### III. Conclusion

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

In the event that this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to Counsel's Deposit Account Number 01-2300, referencing Docket Number 108910-00123.

Respectfully submitted,



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